



Colorado Department
of Public Health
and Environment

Division of Environmental Health and Sustainability

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DISASTER RECOVERY AND FOOD HANDLING FOLLOWING A FLOOD OR NATURAL DISASTER

Sanitation and Hygiene: Preventing illness

- Basic hygiene is very important during this emergency period. Always wash your hands with soap and water that has been boiled or disinfected before eating and after toilet use; cleanup activities; or handling items contaminated by floodwater, debris or sewage. Use of hand sanitizers following hand washing is encouraged.
- Flood waters may contain fecal matter from sewage systems, agricultural and industrial waste, and septic tanks. If you have open cuts or sores exposed to the floodwater, keep them as clean as possible by washing them with soap and disinfected or boiled water. Apply antibiotic ointment to reduce the risk of infection.
- Do not allow children to play in floodwater or with toys that are contaminated by floodwater.
- If floodwaters are covering your septic tank and leach field, you should not use any flush toilets attached to the system. Create a homemade pot-a-john:
 - Use 5- gallon buckets lined with heavy-duty plastic garbage bags.
 - Add deodorizer such as lime, household bleach or kitty litter.
 - Keep buckets, with tight lids, in a cool, dark place/
 - Do not throw human waste in regular trash.
 - Dispose of waste by flushing down the toilet when services are restored or bury it.
 - Clean and disinfect buckets.

Handling Food Following a Flood

Food contamination may be a problem after a flood, tornado, fire or other natural disaster. Floodwaters may carry silt, raw sewage, oil or chemical wastes. Filth and disease bacteria in floodwater may contaminate any foods the water touches, making them unsafe to eat.

Flooded areas may have lost electrical power.

Always keep meat, poultry, fish and eggs refrigerated at or below 41°F, and keep frozen food frozen. If you lose power, keep the refrigerator and freezer doors closed as much as possible to maintain the cold temperature.

- The refrigerator will keep food safely cold for about 4 hours if it is unopened.
- A full freezer will hold the temperature for approximately 48 hours (24 hours if it is half-full) if the door remains closed.

- Obtain dry or block ice to keep your refrigerator as cold as possible if the power is going to be out for a prolonged period of time. Fifty pounds of dry ice should maintain an 18-cubic-foot full freezer for two days.

Examine food carefully after a flood. Contamination may occur if floodwaters have covered, dripped on or seeped into the food. Some foods may be protected by their containers. If you have any doubt about the safety of a food, **it is always better to throw it out rather than risk disease. IF IN DOUBT THROW IT OUT!!** The following guidelines will help you decide when to throw out foods and how to disinfect foods that can be saved.

Do not try to save the following foods if they have come in contact with floodwater:

- Fresh produce from your garden such as lettuce, cabbage and potatoes
- Containers of nuts, spices, seasonings and flavorings
- Canisters or bags of grains, sugar, salt, coffee and tea
- Paper, plastic, cloth, fiber or cardboard boxes of food
- Plastic bags of food, even if boxes and containers inside the bags seem dry. These include pastas, cereals, rice, dried milk, crackers, cookies or mixes.
- Screw-topped or crimp-topped jars or bottles of food that have been touched by floodwaters, even when jars have not been opened. There is no lid in use on glass food containers that will keep out water if the container is immersed. This includes all home-canned foods in glass jars and bottles as well as all jams, jellies, honey, molasses, syrups, fruits, pickles, etc., in glass jars.
- Porous non-food items that are used with food or put into the mouth, and items made of hard rubber, plastic or other flexible (porous) materials, such as baby bottle nipples, pacifiers, and plastic or wooden dishes and utensils.

Disinfecting Food and Utensils after a Flood

Cans of Food - Cans that do not have dents or rust can be saved if they are handled properly *before they are opened*:

- Remove labels. Re-label with a permanent marker.
- Wash the cans in a strong detergent solution with a scrub brush to remove all silt.
- Immerse scrubbed containers completely in a lukewarm solution of chlorine for one minute. See directions in table below for making a chlorine disinfecting solution.
- Remove containers from the chlorine solution. Allow to air-dry before opening. Re-label with a permanent marker, if necessary. Use as soon as possible, because containers may rust.

Dishes and Utensils - Glass, ceramic and china dishes; metal and glass cookware; glass baby bottles; and empty canning jars can be saved in the following way:

- Thoroughly wash them in a strong detergent solution, removing all filth and mud.
- Disinfect in a chlorine solution in the strengths described in the table below. If concerned about harm from the bleach, dishes and utensil can be boiled in water for 10 minutes. Allow to air-dry before using.

Handling Home Furnishings Following a Flood

In general, do not try to save moldy, porous items (items that absorb water). The following items must be thrown away when you can see or smell mold and/or the materials have been under water:

- Carpet, carpet padding and rugs
- Upholstered furniture, mattresses and box springs
- Computers, microwaves, window A/C units and other electronics/appliances that had fans and were housed in moldy rooms
- Papers and books

Items that typically can be saved:

- Nonporous items such as china, glass, jewelry, porcelain and metal
- All-wood furniture with mold growth but otherwise in good condition
- Some electronics and small appliances (depends on flooding conditions)
- Photographs, books and valuable or important legal documents with minor levels of mold growth
- Artwork, textiles and clothing that are not physically damaged

Household Cleanup Following a Flood

It can be difficult to throw away items in a home, particularly those with sentimental value. However, keeping certain items soaked by sewage or floodwaters may be unhealthy. Materials that cannot be thoroughly cleaned, disinfected and dried within 24-48 hours should be discarded.

- Walls, hard-surfaced floors and many other household surfaces must be cleaned with soap and water and disinfected. See directions in table below for making a chlorine disinfecting solution.
- Thoroughly disinfect surfaces that come in contact with food and children's play areas.
- Replace fiberboard, insulation and disposable filters in your heating/cooling system.
- Wear rubber boots and waterproof gloves during cleanup.

Making a Chlorine Disinfecting Solution

Household bleach contains from 5.25 to 8.25 percent chlorine. The amount of bleach to add to water depends on the percent chlorine it contains. Check the bottle label and follow these guidelines:

Outcome	Appropriate Surface	Desired Concentration		Formula/Recipe based on % Sodium Hypochlorite (Bleach to Gallon of Water)					
		Maximum Range (ppm)	Maximum Range (%)	5.25% (US)	5.25% (metric)	6% (US)	6% (metric)	8.25% (US)	8.25% (metric)
Disinfect	Surface Contaminated flood water	800	0.080%	1/4 Cups	60 mL	3.5 TBSP	53 mL	2.5 TBSP	38 mL

Preventing the Growth of Mold

- Moisture that enters buildings from leaks or flooding accelerates mold growth. Molds can cause disease, trigger allergic reactions and continue to damage materials after the storm.
- Remove standing water from your home or office. Remove wet materials promptly and ventilate; use fans and dehumidifiers if possible.
- If mold growth has already occurred, it is best to have a professional remove it.
- Individuals with known mold allergies or asthma should never clean or remove mold.

Small areas of mold growth can be removed with soap and water.

Garbage Storage, Collection and Disposal Following a Flood

As you start cleaning, you will likely produce a great deal of garbage. Local authorities will tell you where and when collection will occur. Garbage invites insects and rodents. Rodents, in particular, may be looking for food because the flood may have destroyed their homes and normal food source.

- Store any garbage in watertight, rodent/insect-proof containers with tight-fitting covers. Use plastic liners if available.

Standing Water: Preventing mosquito-borne illness

Heavy rains and flooding can lead to an increase in mosquitoes that may be infected with West Nile virus. To protect against mosquitoes, remain diligent in your personal mosquito protection efforts. Avoid being outdoors when mosquitoes are most active. For many species, this is during the dusk and dawn hours. Also, observe the following precautions:

- Wear clothing that covers most of your skin.
- Repellents containing DEET (N,N-diethyl-m-toluamide), picaridin or OLE (oil of lemon eucalyptus) are options. Use strictly according to label instructions. Do not allow children to apply repellents, and avoid applying repellents to the hands of young children.
- Check around your home to rid the area of standing water.
- Eliminate other breeding sites. Remove old tires and turn over or remove empty plastic containers.

Swimming Pools, Hot Tubs and Spas

Pools affected by flood waters should be drained and super-chlorinated. Refilling a pool with water from a public water system on a boil order is allowed as long as the pool maintains an adequate disinfection level.

Use of gasoline-powered generators or pressure washers

Carbon monoxide (CO) poisoning from engine exhaust is a common and serious danger that can result in death if generators or gasoline-powered pressure washers are used.

- Never use generators, pressure washers or other gasoline-powered tools indoors or in a garage, carport or basement. They all produce large amounts of CO that can build up to dangerous levels in minutes.
- Keep your generator or pressure washer engine outdoors and well away from windows, doors and intakes.
- Get to fresh air right away and seek prompt medical care if you suspect CO poisoning and are feeling dizzy, light-headed or nauseated.

Generators can cause severe electrical hazards and may cause electrocution or fire if used improperly.

- Most portable generators are designed to work with a few appliances or pieces of electrical equipment that may be plugged directly into the generator without the use of a generator transfer switch.
- This type of generator could be especially useful, but it isn't recommended if you are operating sensitive equipment or have numerous large appliances or business machines.
- When using a portable generator, you also must purchase an electric power cord to feed the electrical equipment.
 - This should be a heavy-duty, outdoor-rated extension cord sized for the total electrical load (voltage and amps) you may need.
 - Choose a cord that exceeds the total expected load to prevent excessive heat buildup and degradation of the power cord.
 - Ensure the cord has three prongs and no splits, cuts or holes in the external insulation covering.
 - An overloaded or damaged power cord can cause electrocution or potentially start a fire.

For additional information, please contact your local public health agency or the Division of Environmental Health and Sustainability at 303-692-3645.